

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Canceled) Please cancel claim 1.

2. (Canceled) Please cancel claim 2.

3. (Canceled) Please cancel claim 3.

4. (Currently Amended) A method for producing a semiconductor device including formation of an interlayer insulating film having a fluorine-doped silicon oxide layer ~~on~~ over a substrate, the method comprising:

forming said fluorine-doped silicon oxide layer in a process chamber; and  
removing a surface layer of said fluorine-doped silicon oxide layer by sputtering in the same process chamber subsequent to the formation of said fluorine-doped silicon oxide layer and prior to formation of an insulating layer over the fluorine doped silicon oxide layer, and wherein the step of removing the surface layer is performed by sputtering such that the temperature during sputtering reaches a value higher than a temperature of forming the fluorine-doped silicon oxide layer.

5. (Previously Presented) The method for producing a semiconductor device according to claim 4, further comprising:

forming an insulation layer over a surface layer of said fluorine-doped silicon oxide layer after the sputtering; and

planarizing said insulation layer with a chemical mechanical polishing process or a plasma etching process from a surface side of said insulation layer without exposing said fluorine-doped silicon oxide layer.

6. (Canceled) Please cancel claim 6.

7. (Previously Presented) The method of producing a semiconductor device of claim 4, wherein the step of removing the surface layer is performed prior to any additional step of further processing the fluorine doped silicon oxide layer.

8. (Canceled) Please cancel claim 8.